Standard ID:	AP-SRC-002
Title:	**Application Sourcing Guideline**
Revision Number:	0
Domain:	Application
Discipline:	Sourcing
Effective:	01/13/2023
Reviewed:	01/13/2023
Approved By:	Chief Technology Officer
Sponsor:	Chief Technology Officer

I. Authority, Applicability and Purpose

A. Authority: Title 29 Chapter 90C Delaware Code, §9004C – General Powers, duties and functions of DTI "2) Create, implement and enforce statewide and agency technology solutions, policies, standards and guidelines, including as recommended by the Technology Investment Council on an ongoing basis and the CIO"

B. Applicability: Applies to all State of Delaware communications and computing resources. The Department of Technology and Information (DTI) is an Executive Branch Agency and has no authority over the customers in Legislative and Judicial Branches, as well as Local Education Agencies, and other Federal and Local Government entities that use these resources. However, all users, including these entities, must agree to abide by all policies, standards promulgated by DTI as a condition of funding, access and continued use of these resources.

C. Purpose: The purpose of this guideline is to assist decision makers when seeking an IT solution to fill their business needs. This guideline is to aid in areas such as security, customization, and resources.

II. Scope

A. Areas Covered: All solutions to business problems.

B. Environments: This guidance is focused on the production environment.

III. Process

A. Adoption: These guidelines have been adopted by the Department of Technology and Information (DTI) through the Technology and Architecture Standards Committee (TASC) and are applicable to all Information Technology use throughout the State of Delaware.

B. Revision: Technology is constantly evolving; therefore the guidelines will need to be regularly reviewed. It is the intent of the TASC to review this guideline annually. The TASC is open to suggestions and comments from knowledgeable individuals within the state, although we ask that they be channeled through your Information Resource Manager (IRM).

C. Contractors: Contractors or other third parties are required to comply with these guidelines when proposing technology solutions to DTI or other state entities. Failure to do so could result in rejection by the Delaware Technology Investment Council. For further guidance, or to seek review of a component that is not rated below, contact the TASC at dti_tasc@delaware.gov.

D. Implementation responsibility: DTI and/or the organization's technical staff will implement these guidelines during the course of normal business activities, including business case review, architectural review, project execution and the design, development, or support of systems.

E. Enforcement: DTI will enforce these guidelines during the course of normal business activities, including business case and architectural review of proposed projects and during the design, development, or support of systems. These guidelines may also be enforced by others during the course of their normal business activities, including audits and design reviews.

F. Contact us: Any questions or comments should be directed to dti_tasc@delaware.gov.

IV. Definitions/Declarations

A. Definitions

1. COTS – Commercial Off-The-Shelf software, for example QuickBooks.
2. Custom[1] - (also known as bespoke or tailor-made) is specially developed for some specific organization or user. As such, it can be contrasted with the use of software packages developed for the mass market, such as commercial off-the-shelf (COTS) software, or SaaS.
3. Host Internally – A solution that is deployed on State infrastructure within a State-owned facility. For example, DTI.
4. Host Externally – for example:

[1] https://en.wikipedia.org/wiki/Custom_software

i. Infrastructure as a Service (IaaS)[2] "The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls)." For example, a DR/BC site. While the term IaaS is not utilized in this document, it is presented here for the purposes of comparison to PaaS and SaaS.

ii. Platform as a Service (PaaS) – "The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment." For example, Amazon Web Services (AWS).

iii. Software as a Service (SaaS) – "The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings." For example, SalesForce.

5. Managed business services[3] - the practice of outsourcing day-to-day management responsibilities and functions as a strategic method for improving operations and cutting expenses this can include outsourcing for example business processes like HR, or licensing.
6. Managed IT services[4] - the practice of outsourcing day-to-day management responsibilities and functions of IT as a strategic method for improving operations and cutting expenses. This can include outsourcing IT processes like Virtual Application Services or licensing a third party to manage relationships between cloud providers.
7. Recoverability – the ability to be restored to a normal operational state.
8. Reliability - the ability to be relied on or depended on, as for accuracy, honesty, or achievement.

[2] http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf for the definitions of SaaS, PaaS and IaaS

[3] https://en.wikipedia.org/wiki/Managed_services

[4] https://en.wikipedia.org/wiki/Managed_services

9. Security - the protection of information assets through the use of technology processes.

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B. Declarations

1. The following sourcing list should be used when choosing a solution that satisfies the organization's requirements. All sourcing decisions should utilize this list in the order presented. For example, SaaS is to be eliminated as a suitable solution before COTS can be considered.
    - Existing State application or contract regardless of premises
    - SaaS application
    - COTS application using PaaS with vendor support
    - COTS application using internally hosted with vendor application support
    - Custom application using PaaS with vendor support
    - Custom application internally hosted with vendor application support
    - Custom application internally hosted with State application support

V. Guidelines

A. Considerations

1. Solve the Business Needs
    i. This guideline is to assist decision makers when seeking an IT solution that fills their business needs. This guideline is to aid in areas such as security, customization, and resources.
    ii. When an IT solution is called for, a team of subject-matter experts is assembled to find the right solution. Those chosen to pick the solution face a forest of acronyms, mergers, consolidations, start-ups, privacy breach reports, RFP and contracting rules, and competing claims from vendors and consultants.
    iii. The determination of the levels of risk and the appropriate measures to be taken to manage the risks should be determined by all affected ISO's and IRM's.
2. Repair or Replace
    i. The decision whether to repair a system or replace it traditionally has been tied to the amount of funding available. Until the philosophy of an IT depreciation cycle becomes a part of the budgeting and planning process, we will continue to struggle with outdated, costly software that is difficult to support in addition to a mounting list of ancillary systems needed to support production.

1. Expect hardware to have a 3 - 5 year lifespan[5].
2. Operating systems typically last less than 9 Years[6].
3. The optimal[7] average lifespan of a programming language is 9[8] years before they become exceptionally costly to maintain.

ii. Budget submissions and business cases should always include at least 20% of the cost of the system annually. This will allow for depreciation and changes in technology. As the current system technology nears end-of-life, business processing analysis and budget requests must be analyzed more closely.

iii. In addition, the organization needs to consider the impact to its operating staff, its Service Desk and its vendor managers. When contracting with a cloud provider, the cost of vendor management, SLA management, business analysts and IT specialists must be included in calculating the true cost of the cloud solution. The impact on staff and productivity is very often under-estimated.

iv. The decision to repair or replace a system or component should be led by risk and cost management. When performing major repairs all technology that is disallowed or nearing end-of-life, must be replaced with a standard technology.

v. Before making the final decision to repair or replace a system consult and adhere to the current State standards and policies. Spending time and money to implement outdated, unsupported or disallowed platforms is against State policy.

vi. Always consider the life-cycle of the programming language, operating system and hardware whenever major changes to the system are required.

3. Commercial off the Shelf (COTS) vs Customized

i. When choosing a solution, it is best to keep modifications to the application system to a minimum (Zero-software code configuration). Adopting this strategy may require changes in business practices or processes, however, when an application system is customized, the costs for upgrades and maintenance increase.

ii. All requests for customization should be analyzed to ensure that the total cost of the system over 5 – 15 years does not outweigh the business value of the system.

iii. Advantages of Customizations[9]

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[5] http://www.irs.gov/irm/part1/irm_01-035-006.html

[6] http://benjamin-schweizer.de/operating-systems-lifecycle-chart.html

[7] Before finding knowledgeable programmers becomes problematic

[8] http://www.levenez.com/lang/

[9] https://blogs.oracle.com/stevenChan/entry/ebs_customization_implications

1. Functionality meets your requirements more closely

iv. Disadvantages of Customizations
   1. More costly than deploying a "plain vanilla" solution
   2. Requires specialized development skills
   3. May require updates, testing, and maintenance whenever:
      a. New patches are released
      b. New architectures are deployed
      c. New technology certifications are released
   4. Increases support complexity and overhead
   5. Can potentially complicate upgrades to new releases

v. The costs for development and implementation occur once; the increased costs for maintenance and upgrades of customized code are continuous.

vi. In all cases, the solutions first to be reviewed for suitability are the existing State's systems and cloud vendors under State contract.

vii. Regardless of the type of chosen solution, the recurring costs for maintenance, support and upgrades must be included in the contract and planned for in succeeding budget years.

viii. The expected lifespan of a large application should be a maximum of 15 years.

ix. The per-year software maintenance for a COTS solution is generally 20% of the list price.

x. The total cost of a COTS solution has been estimated to be at least 3 times the initial investment over a 15-year lifetime. This does not include hardware or operating system upgrades, or system maintenance.

xi. A Highly customized COTS solution has been estimated to be more than 10 times the initial investment[10] over a 15-year lifetime.

xii. For example, the total cost of ownership of a $1 million application system (including licenses, implementation and training) over a 15-year lifetime will cost:
   1. $3+ million for little or no customization
   2. $30+ million for a highly customized solution

xiii. Of the many considerations to be taken into account when choosing an IT solution are:

[10] "The Four Laws of Application Total Cost of Ownership" 03 April 2012 G00230382

Gartner Analyst(s): Andy Kyte

1. Risk –
    a. Security
    b. Privacy
    c. Reliability
    d. Recoverability
2. Uniqueness of the business processes
3. The available human resources to dedicate to a new solution
4. The available IT capacity or capability to dedicate to a new solution
5. The frequency of changes to essential requirements

xiv. The required reliability and recoverability should be contracted regardless of whether the solution is internally or externally hosted. It is noted that Delaware is a small State and as such, may not be seen as critical when reliability and recoverability are essential.

B. <u>When the Risk is low and IT resources are low, look to:</u>

1. Host Externally
    i. SaaS
        1. Common business processes
        2. Low frequency of requirement changes
        3. Low availability of process knowledge workers
    ii. COTS
        1. Unique business processes
        2. Low frequency of requirement changes
    iii. Custom
        1. Extremely Unique business processes
        2. High frequency of requirement changes

C. <u>When the Risk is High and IT Resources are low, look to:</u>

2. Host Internally
    i. COTS
        1. Unique business processes
        2. Low frequency of requirement changes

ii. Custom

1. Extremely Unique business processes
2. High frequency of requirement changes

D. <u>When Business Resources are very scarce or can be put to better use elsewhere, look to:</u>

1. Managed Business Services
    i. Common business processes
    ii. Low frequency of requirement changes

E. <u>When IT Resources are very scarce, or can be put to better use elsewhere, look to:</u>

1. Managed IT Services
    i. Commodity IT services
    ii. Low frequency of requirement changes or flexible contracting

VI. Development and Revision History

Date	Revision
1/13/2023	Rev 0 – Initial version based on prior policy